Comments of Pacific Gas & Electric Company

Day Ahead Market Enhancements August 13th Working Group

Submitted by	Company	Date Submitted
Paul Gribik (415-973-6274) Simon Ou (415-973-6125)	Pacific Gas & Electric	August 27th, 2019

PG&E remains supportive of CAISO's effort to make improvements to the Day-Ahead Market (DAM) to more efficiently address uncertainty in loads and Variable Energy Resource production. However, we have become increasingly concerned that CAISO is not providing sufficient details for stakeholders to understand and evaluate the proposals. PG&E understands that CAISO has utilized technical workshops to discuss different design proposals and to receive stakeholder feedback (i.e., should CAISO pursue a sequential IFM-RUC design versus an integrated one). However, PG&E finds that this approach has not been constructive. The information provided by the CAISO during these workshops lacks sufficient details for stakeholders to understand the proposals fully. As a result, it has been difficult for participants to evaluate the ramifications of the proposals without making assumptions about how its proposed market design would function. PG&E offers the following comments as requests and recommendations to CAISO regarding this initiative, and it can be summarized as follows:

1. PG&E believes that the best way to move forward is for CAISO to put forth a straw proposal with a clear problem statement, description of proposed changes with detailed mathematical formulation, and an explanation on how the proposed Day-Ahead Market design interacts with the Real-Time Markets, including the impact to settlement rules.

2. PG&E provides examples of areas on which CAISO should provide clarity in its next straw proposal.

1. <u>PG&E believes that the best way to move forward is for CAISO to put forth a straw proposal with a clear problem statement, description of proposed changes with detailed mathematical formulation, and an explanation on how the proposed Day-Ahead Market design interacts with the Real-Time Markets, including the impact to settlement rules.</u>

In order to move forward in this initiative, PG&E recommends that CAISO focus on putting forth a straw proposal that clearly specifies the direction of this initiative. This is very necessary given that no straw proposal has been published since CAISO decided not to pursue the 15-minute granularity design. PG&E requests that CAISO restart the usual stakeholder engagement process and provide a straw proposal for stakeholders to provide feedback that includes three key elements:

- a problem statement with clear definitions that properly distinguishes between granularity versus uncertainty,
- a proposal that that describes and enumerates the market design changes along with its mathematical formulations, and

- a detail explanation of how this design integrates with the real time markets that also considers the impacts to current settlement rules.

PG&E recommends that the CAISO takes its time to work through its new proposal. The rush to keep to the original proposed timeline given how much the initiative has changed has only caused confusion and frustration. PG&E still believes this is a worthwhile initiative, but we urge the CAISO to slow down and be more deliberate in its design process.

2. PG&E provides examples of areas on which CAISO should provide clarity in its next straw proposal.

PG&E has several areas on which it has questions and concerns regarding the DAME proposals. These concerns may be due to lack of understanding of the CAISO's proposals or due to problems with the proposals. More detail is needed to properly evaluate. Below, PG&E outlines three areas of concern. These are not an exhaustive list since some concerns may be addressed if CAISO provides more information on how their market proposals would function.

Settlements

One area that lacks adequate detail involves settlements. For brevity, we will focus on questions involving Option 2. While PG&E is intrigued by Option 2, there are details regarding its operation that remain unclear. Other questions exist for Option 1.

The Option 2 market optimization contains two power balance constraints (one for energy utilizing cleared bid-in demand and one for reliability capacity using CAISO forecast demand). When CAISO started the DAME process, it proposed moving to scheduling the Day-Ahead Market on 15-minute intervals. At that time, we understood that CAISO proposed settling energy scheduled from physical supplies using LMPs that incorporate the shadow prices of the two power balance constraints while it proposed settling energy schedules for cleared demand and virtual supplies based on LMPs that only incorporate the shadow price of the first power balance constraint. Since restarting the initiative, CAISO has not discussed this aspect of settlements. It is unclear to PG&E whether this is still CAISO's proposed settlement approach. If it is, PG&E believes that there will be a revenue shortfall that will have to be made up potentially by an uplift process. This may occur because physical supplies will be paid based on prices that incorporate the shadow price of the reliability power balance constraint while demands will be charged prices that do not similarly incorporate this shadow price. The details of the settlements approach should be provided so that participants can evaluate the performance of the approach and assess the potential for unwarranted cost shifts across participants.

Other settlements-related issues exist. For Option 2, DAM will pay a physical supply the value of the energy it provides (incorporating the shadow price of the first power balance constraint) and the impact of its energy schedule on the reliability capacity requirement (shadow price of the second power balance constraint). In the Real-Time Markets, there is no reliability capacity requirement and corresponding price. It is unclear how changes in energy scheduled from a physical supply between DAM and the Fifteen-Minute Market (FMM) should be settled. In DAME the physical supply is modeled and paid for providing energy and for affecting reliability capacity, while FMM only models and settles changes in energy provided since reliability capacity is not modeled. If a physical supply

reduces it energy schedule in FMM, it will only pay for buying back energy that was scheduled in DAME. PG&E has concerns that this discrepancy may provide opportunities for strategic actions to inappropriately inflate profits.

To reiterate, PG&E is not opposing any of the proposals put forth by CAISO. PG&E is pointing out concerning areas and believes that more details are needed to properly evaluate those areas.

Uncertainty and Granularity

PG&E appreciates that data analysis provided by CAISO on differences between: 1) cleared net load in IFM, 2) forecast net load in RUC, and 3) forecast net load in FMM. However, it is not clear to PG&E how the data being analyzed were compiled.

For example,

- Cleared net load in IFM is clearly load cleared in an hour minus VER supply cleared in the hour.
- Forecast net load in RUC is clearly load forecast in an hour minus VER supply production forecast in the hour.
- Forecast net load in FMM is less clear. Is it treated on a fifteen-minute basis as load forecast in a fifteen-minute interval minus VER supply production forecast in the period? Or is it treated on an hourly basis as sum over the fifteen-minute intervals in an hour of the load forecast in each fifteen-minute interval minus VER supply production forecast in the period?

If forecast net load in FMM is summed over the fifteen-minute periods in an hour and compared to cleared net load in IFM, the analysis would evaluate the hourly uncertainty between IFM and FMM hourly net loads. However, it would not capture an estimate of granularity differences.

If FMM net load is calculated for each fifteen-minute period in the hour, PG&E has questions regarding the comparison of an hourly average net load from IFM with the individual fifteen-minute net loads in FMM. Is CAISO comparing the maximum (and minimum) FMM net load over the fifteen-minute periods in an hour to the cleared hourly IFM net load. This would seem to overestimate the uncertainty in hourly net loads between IFM and FMM. Also, it may overestimate the ramp capability needed for granularity. Suppose that net load grows in FMM in each fifteen-minute period in an hour. Assuming that ramp capability is required to move from the hourly average IFM cleared net load to the maximum FMM net load in the last interval would the overestimate ramp required in a fifteen-minute period since FMM would meet the change over the hour by ramping in each fifteen-minute period in the hour rather than ramping in only the last period in the hour.

PG&E requests that CAISO clearly specify how the data used in its analysis were defined so that it can properly assess the implications of the analysis.

Correcting issues with Flexible Ramping Product in FMM

CAISO recognizes that it must model deliverability of Imbalance Capacity Reserves in DAME. Procuring Imbalance Capacity Reserves that cannot be deployed to meet needs due to transmission constraints does not provide any benefits to the market. Currently, CAISO seems to have problems

ensuring the deliverability of Flexible Ramping Product that it procures in the Real-Time Markets. CAISO could settle changes between Imbalance Capacity Reserves scheduled in DAM and Flexible Ramping Product scheduled in FMM at the Flexible Ramping prices in FMM. For this to provide proper signals, CAISO would have to model and ensure deliverability of the Flexible Capacity Product that it procures in the FMM. CAISO must ensure that it properly models the effect of transmission constraints on the deliverability of its procured Flexible Ramping Product in the Real-Time Markets. This problem should be addressed before implementing the Imbalance Capacity Reserves in DAME.